INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
sustainable solutions for ending hunger and poverty
Supported by the CGIAR

Constraints to Fertilizer Use in Nigeria: Perspectives and Insights from the Agricultural Extension Service

Afua B. Banful, Ephraim Nkonya, Victor Oboh

The importance of agriculture in Nigeria's economy cannot be understated. Farming and livestock rearing is the main livelihood for over 70 percent of households in the country.[1] In 2008, agriculture contributed 42 percent of the country's GDP, significantly higher than the 18 percent derived from petroleum and natural gas production.[2] However, the country's promising agricultural potential has not been realized. In all likelihood, low fertilizer use is a major factor in explaining the stagnant agricultural productivity in Nigeria.

Widespread introduction of fertilizer began in the late 1970s with the proliferation of Agricultural Development Projects (ADPs). This brief presents the insights of village extension agents (VEAs) who are at the heart of the ADP concept and provide a uniquely informed perspective of the constraints to fertilizer use in the country.

Fertilizer

The federal government of Nigeria (FGN) recognizes that the nation's food security can be improved mainly through increasing agricultural productivity, and has instituted various interventions aimed at precipitating widespread adaptation of intensive farming technologies. By scope and financial commitment, the most important intervention is the subsidization of inorganic fertilizer.

Since the late 1970s, fertilizer has typically been heavily subsidized, with rates that have been as high as 95 percent.[3] The pattern of total fertilizer consumption in Nigeria has mirrored the ebb and flow of federal and state government subsidies and the almost annual changes in procurement and distribution rules. Currently, the FGN, under the Federal Market Stabilization Program (FMSP), procures fertilizer for sale to states at a subsidy of 25 percent. State governments typically institute additional subsidies on fertilizer. Under the current marketing structure, companies make bids to the FGN to import and distribute subsidized fertilizer.

Several states also procure fertilizer outside of the FMSP for sale to their farmers (Table 1). Nevertheless, only an estimated 30 percent of subsidized fertilizer reaches small farmers at the subsidized price.[4]

There is remarkable variation in the subsidy rates state governments provide on the already federally subsidized fertilizer (Table 1), ranging from 0 to 50 percent. In a typical state, there is federally subsidized fertilizer, federally plus state subsidized fertilizer and, (in principle) unsubsidized fertilizer procured through private channels. Arbitrage opportunities and incentives to mislabel the source of fertilizer abound.

The amount of fertilizer farmers have access to varies widely across states. Though Anambra and Bauchi have similar numbers of farming households, in Anambra, the amount of federally procured fertilizer per agricultural household is on average about one-tenth of a bag (50kg) compared to three bags in Bauchi. While the tonnage of fertilizer procured outside the FMSP is not available, data here provides every indication that

in 2008 in no state did the average farmer have access to sufficient fertilizer for one hectare.

Table 1: 2008 State government fertilizer subsidies

	MT procured[b]	Kg/ household[c]	Subsidy[d] (%)
North-East			
Adamawa[a]	26700	87	18
Gombe[a]	29100	142	23
Bauchi	44200	162	24
Taraba[a]	28200	117	24
Yobe[a]	5070	56	19
Borno[a]	9330	20	19
North-West			
Jigawa[a]	13560	32	49
Kaduna	9870	27	18
Kano[a]	32207	97	40
Katsina[a]	6300	15	42
Kebbi[a]	35036	122	12
Sokoto[a]	16590	53	50
Zamfara[a]	32800	115	11
North- Central			
Benue[a]	23130	39	50
FCT	8000	208	0
Kogi	40560	118	17
Kwara[a]	3930	26	23
Nassarawa	24000	100	15
Niger[a]	27990	76	17
Plateau[a]	27000	87	17
South-East			
Abia	6000	13	17
Anambra	2270	6	12
Enugu	8359	30	3
Ebonyi[a]	2589	9	2
Imo[a]	6963	12	11
South-West			
Lagos	600	14	0
Ekiti	7600	47	19
Ogun[a]	3600	11	10
Ondo[a]	2550	5	12
Oyo	8200	23	0
Osun[a]	8998	38	11
South- South			
Akwa-Ibom[a]	9650	30	18
Bayelsa	4800	54	0
Cross-River	9330	19	6
Delta[a]	2760	7	0
Edo	8400	20	14
Rivers[a]	7800	13	0

Source: Federal Fertilizer Department. [a]State procures fertilizer from other sources in addition to FGN. [b] Procured from FGN. [c]Agricultural households. [d]Exclusive of 25 percent federal subsidy.

Village extension agents

Who are village extension agents?

Extension workers are native to the state in which they work and are very familiar with the local languages. The majority has a college certificate or diploma. VEAs report that extension work is their sole occupation but they are occasionally also involved in farming. At all levels, the extension staff consists almost entirely of men, and the average age of VEAs is 44 years.

Extension constraints

The extension staff in Nigeria is severely stretched, and in all states only a small share of farmers can plausibly access their services (Table 2). In nearly all states, more than 70 percent of VEAs said there was insufficient extension staff to provide services to all farmers who desired it.

Table 2: Overview of extension service in sampled states

State	Staff(a)	Percent Male	Households/ VEA (b)	Farmers met/ VEA (c)
Edo	27	89	15460	637
Bayelsa	12	67	7447	260
Plateau	165	59	1873	696
Taraba	147	84	1634	158
Sokoto	85	94	3684	460
Zamfara	164	95	1737	1623
Yobe	249	93	366	903
Jigawa	325	86	1300	1227

Source: Authors' survey. (a) Extension staff includes individuals in management. (b) Agricultural households. (c) Average number of farmers met per extension staff over past year.

This situation is compounded by the advanced age of most VEAs, as in the near future the service will lose a substantial number of experienced workers.

There is wide variation in the work load expected of extension workers by state. For example, in order for all farmers to receive extension service in Edo state, one VEA would have to meet with 41 farming households, probably consisting of more than one farmer, every day of the year. The actual work load of extension workers is likely to be even higher than estimated because the number of extension staff includes individuals in managerial roles who do not interact with farmers.

There is also wide variation across states in the number of farmers one VEA interacts with. Bayelsa has one of the lowest farmer interactions per VEA even though it is a state with a large shortage of VEAs. An explanation may be in the inadequacy of transportation facilities for VEAs in that state. In Zamfara and Jigawa, where 65 percent and 85 percent of agents respectively say they have access to a vehicle for work, one VEA reaches between five and six times more farmers than a VEA in Bayelsa where only 27 percent of agents say they have access to a vehicle.

The fact that extension agents are almost all men may limit women's access to extension services because of social norms. Very few female farmers and female-headed households benefit from extension services. Even by the liberal measure of working with at least one female-headed household, as many as 30 percent of extension agents in Taraba, Yobe and Jigawa have no contact with female-headed households. The prevalence of subsistence farming among females who do receive extension services is lower than among males. This suggests that females who are beneficiaries of extension services are the more commercial oriented female farmers.

VEAs and farmer interaction

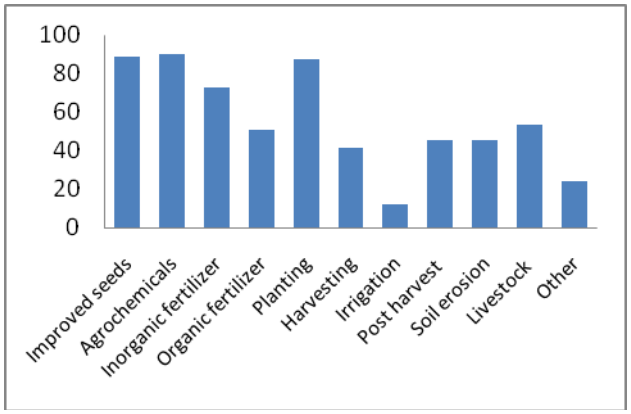
Most VEA interaction with farmers happens in small farmer group (SFG) settings (Table 3). In all states, VEAs report that the predominant reason for forming SFGs was to provide extension services. However, typically, farmers must contribute money in order to be part of an SFG. Because the function of SFGs has evolved to include access to subsidized inputs, the financial contribution requirement for membership is tantamount to farmers paying directly for access to extension services (and subsidized inputs).

The extension messages VEAs report transmitting show that they do not cover several important topics and techniques (Figure 1). On average, only 73 percent of VEAs say they have provided a farmer any information about inorganic fertilizer in the last twelve months. Furthermore, there is variation in extension messages across states, and the national averages conceal some alarming state-level trends. For instance, only VEAs in Sokoto, Zamfara and Jigawa reported providing advisory services on irrigation techniques even once over a 12 month period.

The underperformance of extension service is highlighted by examining the technology VEAs report transmitting most often. Increases in farm productivity require a three pronged approach of adoption of high yielding seed varieties, fertilizer, and irrigation. It is apparent, however, that transmission of fertilizer technology lags far behind transmission of improved seed technology (Fig. 2).

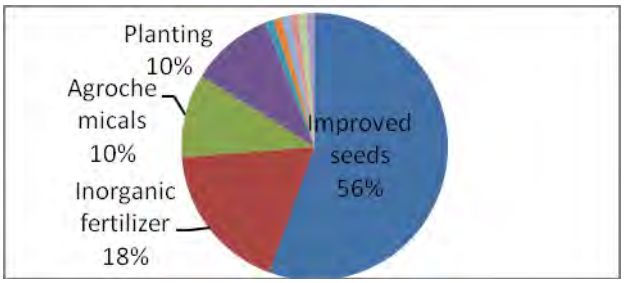
VEAs report being heavily involved in distributing inputs, especially seed. In this role again there is variation across states with major differences even in neighboring states (Table 4). There is apparently little targeting of these inputs. With the exception of the southern states of Edo and Bayelsa, less than 25 percent of VEAs who distributed inputs reported targeting any group.

Figure 1: percent of VEAs who have advised on technology at least once in last 12 months



Source: Author survey. "Other" includes marketing & financial literacy, rural livelihoods and group formation.

Figure 2: Most transmitted technology



Source: Authors' survey. Unlabelled are: organic fertilizer, harvesting, irrigation, food processing, erosion control, livestock technology, all 1 percent.

Table 3: SFG and VEA interactions with farmers

State	SFG is most important mode of farmer interaction, % of VEAs	Average number of SFGs in VEA jurisdiction	Range of SFG size	Most important activity: Receive extension service, % of SFG	Most important activity: Access to cash credit or subsidized inputs, % of SFG	Money required for SFG membership , % of SFG
Edo	61	29	19 – 37	50	50	78
Bayelsa	91	86	15 - 26	27	64	100
Plateau	85	37	12 - 27	90	10	90
Taraba	50	9	21 - 42	95	5	55
Sokoto	75	14	19 - 46	30	40	80
Zamfara	45	24	16 - 34	21	42	65
Yobe	60	9	17 - 39	50	20	80
Jigawa	55	21	18 - 60	45	30	75

Table 4: Percent of VEAs who distribute inputs

	Seed	Fertilizer	Pesticides	Cash
Edo	44	44	22	22
Bayelsa	82	64	18	64
Plateau	50	40	30	20
Taraba	5	5	0	0
Sokoto	15	10	5	0
Zamfara	65	70	70	15
Yobe	5	5	0	0
Jigawa	65	65	70	20
All sampled	39	36	28	15

VEAs' perceptions of fertilizer use

In nearly all the surveyed states, extension agents report that farmers believe fertilizer is important in increasing their output. Their perceptions suggest the major reason for low use of fertilizer in Nigeria is not affordability or lack of knowledge, but rather difficulties in accessing the product at the time that it is needed (Table 5).

Poor quality of fertilizer is often cited as a major constraint to fertilizer use in Nigeria. However the evidence shows that VEAs do not perceive that the quality of fertilizer in Nigeria is low. The problems of fertilizer quality in Nigeria commonly mentioned range from "insufficient nutrient content" to "short weights of fertilizer in bags" and "willful adulteration and other economic or trade crimes." [6]

Table 5: VEA perceptions of fertilizer use

Statement	**Agree, % of VEAs**
Farmers in my area of operation know the recommended application rate	64
Farmers in my area of operation can afford to use fertilizer	66
The quality of fertilizer that is available in my area of operation is high	88
Farmers in my area of operation who do not use fertilizer would use it if they had access to fertilizer	97
Farmers in my area of operation can easily identify the different kinds of fertilizer and tell the difference between which one is relevant to their crops	82
Farmers in my area of operation generally know the kind of fertilizer they need to apply to the particular crops they are growing	84
Farmers in my area of operation have easy access to adequate amounts of fertilizer	25
Fertilizer is available at the correct time that it is needed for application	25

Why do so many VEAs surveyed (88 percent) disagree with the prevailing wisdom? Perhaps few farmers actually use fertilizer, or those who experience problems do not complain to VEAs. Alternatively, perhaps farmers use such small amounts of fertilizer that they are unable to perceive its effects (or lack thereof).

What VEAs know about fertilizer

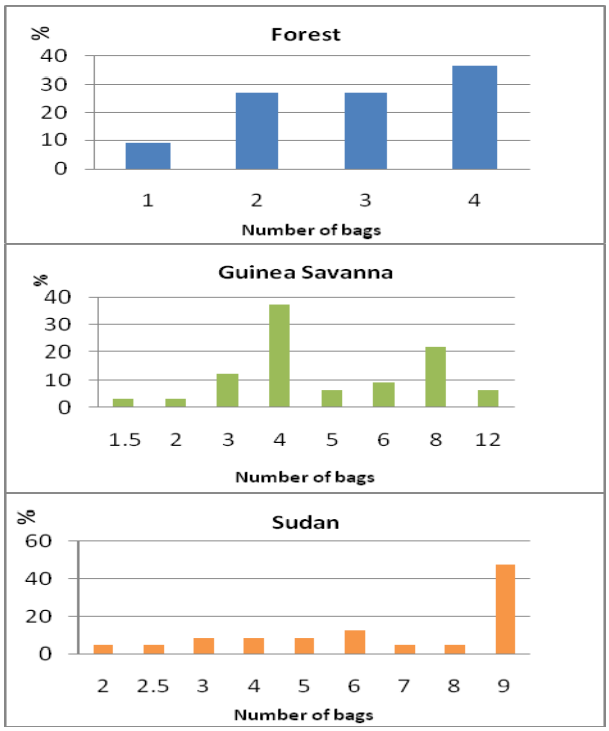
One critical assumption behind the desirability of increased VEA-farmer interaction is that farmers receive accurate and useful extension advice from VEAs. VEAs in the sample were asked to provide the recommended types and amounts of fertilizer for any three crops of their choice. The results of this exercise suggest that there are serious lapses in their knowledge. Less than 80 percent of VEAs were able to provide fertilizer information on three crops of their choice (Table 6). In the southern states, almost 20 percent were unable to provide information for a single crop.

Table 6: Percent of VEAs who could provide fertilizer application rates (basal or top dressing)

	No crops	1 crop only	2 crops only	3 crops
Edo	17		11	72
Bayelsa	18		18	64
Plateau		5	45	50
Taraba		10	25	65
Sokoto			10	90
Zamfara			5	95
Yobe			5	95
Jigawa	5	10		85
All sampled	4	3	15	78

The vast majority of VEAs provided application rates in terms of number of bags and not nutrient content, as is often provided in planting manuals. This suggests a disconnect between the format in which research information is transmitted to VEAs and the format in which it is required. In addition, there are notable differences in the rates of application recommended by VEAs within the same state. The manual produced by the federal fertilizer department and the Federal Ministry of Agriculture and Water Resources gives the recommended application of NPK 20:10:10 as a top dressing on maize as 7 (50kg) bags in Bayelsa and Edo (forest zone), 13 bags in Taraba and Plateau (Guinea zone) and 6 bags in Sokoto, Zamfara, Yobe and Jigawa (Sudan zone).[6] Figure 3 shows the conflicting responses of VEAs.

Figure 3: Distribution of VEA recommended application rates of NPK 20:10:10 on maize



The wide variation in what they recommend reveals that there is confusion among VEAs on optimal application rates. VEAs also lack knowledge about the various types of fertilizer. The majority (more than 70 percent) recommended NPK 20:10:10. Forty percent of VEAs recommended NPK 20:10:10 as top dressing, even though scientific research recommends use of urea or SSP.

Price observations

Analysis of the market prices of fertilizer across the country shows a counterintuitive state of affairs. Prices in the northern states, which could reasonably be expected to be higher due to transportation costs (from ports on the coast), are generally lower than prices in the south (Figure 4).

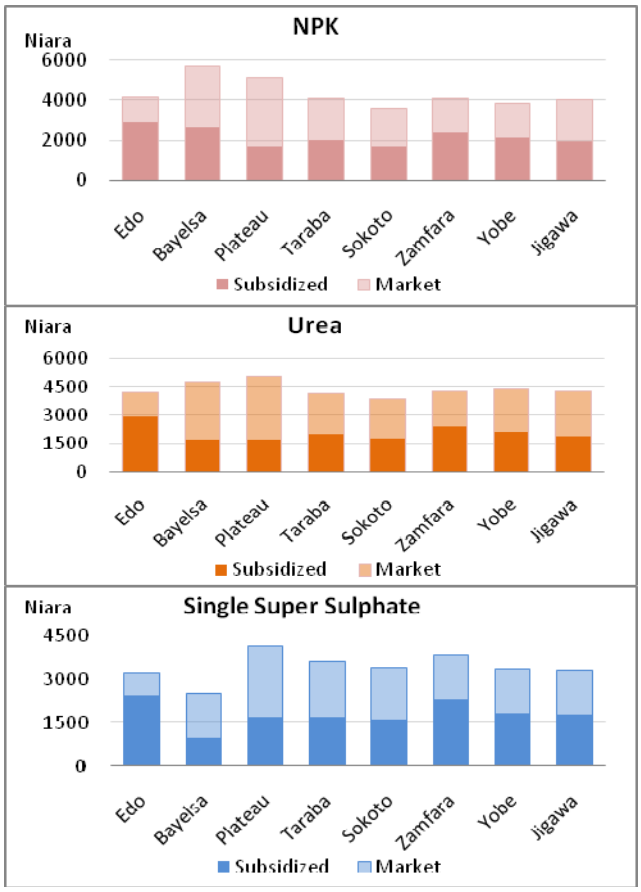
Zamfara was the only sampled state that had a functional blending plant in 2008, yet market prices

in that state tended to be higher than in nearby states with higher subsidy rates. Economies of scale from the higher amount of fertilizer used in the northern states may partially explain this situation but the evidence suggests strongly that fertilizer sold by the private market is leaked from subsidized sources: where the government subsidized fertilizer is cheaper, "unsubsidized" fertilizer is also cheaper, despite potentially higher transportation costs.

Conclusions

According to extension agents, the primary constraint to fertilizer use in the country is the physical absence of the product at the time that it is needed, rather than problems of affordability or farmers' lack of knowledge about its importance. VEAs' knowledge on the use of fertilizer is inadequate and their role in input distribution may be compromising their advisory services. While use intensity is low across the country, states vary in this dimension. Fertilizer consumption and subsidy rates are generally higher in the cereal growing northern part of the country. However, variation even within this region suggests that in Nigeria, fertilizer supply is driven by considerations for state budget size and political economy rather than demand for the products.

Figure 4: Price per 50Kg bag of fertilizer



Notes: [1] CIA World Fact Book; [2] National Bureau of Statistics, Abuja Nigeria; [3] Nagy, G.J. and O. Edun 2002. Assessment of Nigerian government fertilizer policy and suggested alternative market friendly policies ; [4] Gregory, I. 2008. Report on 2008 and 2009 fertilizer voucher program in conjunction with NPFS and ministry of agriculture and water resources and state ministries of agriculture; [5] Victor Chude, 2006. Fertilizer Situation in Nigeria; [6] Federal fertilizer department and federal ministry of agriculture and rural development, 2002. Fertilizer Use and Management Practices for Crops in Nigeria.

This brief is excerpted from a forthcoming IFPRI synthesis report on fertilizer use in Nigeria. It is intended to promote discussion; it has not been formally peer reviewed, but it has been reviewed by at least one internal and/or external reviewer.

This publication was made possible through support provided by the Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS) program, financed by the U.S. Agency for International Development and implemented by Chemonics under contract number 620-C-00-05-00077-00. The opinions expressed in this publication are those of the author(s) and do not necessarily reflect the views of Chemonics and/or the U.S. Agency for International Development.

For more information:

IFPRI-Abuja
International Food Policy Research Institute
c/o International Center for Soil Fertility and Agriculture Development
Plot 18 Colorado Close
Maitama, Abuja
Nigeria
Tel: +234 (9) 413-5960
Fax: +234 (9) 4130873
E-mail: ifpri-nigeria@cgiar.org
www.ifpri.org